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NAS PENSACOLA
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U S NAVY RESPONSES TO REGULATOR COMMENTS ON SITE 41 WETLANDS NAS PENSACOLA FL
11/16/2007
NAVFAC SOUTHERN

Response to Comments
Florida Department of Environmental Protection
Site 41 NAS Pensacola Wetlands
Dated January 23, 2006
November 16, 2007

Comment 1:
Total DDT concentrations: DDT concentrations in sediment were assessed through comparison of individual sample concentrations to a calculated “base wide level” of total DDT. Sample concentrations above the “base wide level” were considered to pose risk, while concentrations below were not. This total DDT threshold concentration was developed by generating a base wide value for each of the DDx metabolites (4,4’-DDE and 4,4’-DDD and 4,4’-DDT), then summing these values to obtain a base wide value for total DDT. However, the basis for determining each of the “base wide” levels of DDE, DDD, and DDT is not clear. It appears that DDx metabolite concentrations were examined from both IR-related and non-IR-related (reference) wetlands, and from there, a base wide concentration for each compound was agreed upon. A better explanation and justification for the base wide levels is needed because they are above ecological sediment screening values such as the Probable Effects Level (PEL) for Florida coastal waters.

Response:
The data provided in the Appendix was evaluated to determine the base wide levels indicative of routine application. The data were evaluated in a conference call with Tom Dillon (NOAA), David Grabka (FDEP), Allison Harris (EnSafe) and Ron Joyner (NAS Pensacola) on December 21, 1998. The members agreed to include all Site 40 and 41 data including data from other literature sources in the data evaluation and determination of base-wide levels.

The DDD basewide level of 50 ppb was based on the NOAA study and the highest detection in the "blue-coded" wetlands. The DDT basewide level of 20 ppb was based on the NOAA study and the highest detection in the "blue-coded" wetlands. The DDE basewide level is based on the highest detections in the "blue-coded" wetlands. Scatter plots of the data were used and can also be provided. The meeting minutes are provided in Attachment 1.

Note that DDT metabolites were not evaluated only using the basewide levels. All DDT metabolite data were assessed using food chain model, resulting in multiple lines of evidence to assess potential excess risk.

Comment 2:
Food chain modeling: Conclusions were made regarding ecological risk posed by bioaccumulative contaminants through the use of a food chain model. Three species were used in the model: the green heron (*Butorides virescens*), the mink (*Mustella vison*), and the rd drum. Food ingestion rates for the heron and mink were taken from sources dated 1978 and 1951, respectively. Ingestion rates for the heron and mink are about ten-times lower than the current EPA Ecological Exposure Factors for these species (see EPA website (www.epa.gov/epaoswer/hazwaste/id/hwirwste/sab03/vol2/2-chapt12.pdf). Since the LOAEL HQs for some contaminants were just below 1.0 resulting in conclusions of no ecological risk, it is recommended that these be

re-calculated using the up-to-date food ingestion values from EPA. This may result in the food chain model revealing greater risk for these contaminants than originally described.

Response:
The ingestion rates and body weights used in the food chain models were provided to the Navy by USEPA Region 4 Science & Ecosystems Support Division in an email dated December 5, 2003. The ingestion rates and body weights used are reported on a dry weight basis. The values contained in the EPA Ecological Exposures Factors reflect a wet weight basis. Only dry weight values were used for consistency with the laboratory data. The email and provided table are included as Attachment 2.

Comment 3:
TPAH comparison to Swartz median effects concentration (MEC): For many wetlands, tPAH values were normalized to sample-specific TOC and compared to the Swartz 1999 Median Effects Concentration (MEC) of 1,800 ug/g. tPAHs were eliminated from concern if their concentrations fell below the MEC. The MEC is an indicator of median effects and lies within the transition between nontoxic and highly toxic sediment concentrations — it is simply a point near the middle of this gradient. According to Swartz, the MEC should "not be used to discriminate acceptable from unacceptable conditions." In other words, the MEC should not be used as a refining number since it does not offer any definitive information on toxicity. It is our recommendation that the Florida probable effects (TEL/PEL or TEC/PEC) sediment quality guidelines (MacDonald 2003) be given more weight through comparison to the dry weight tPAH concentrations. For example, in a case where the tPAH value is above the PEL (16.7 ug/g) but below the MEC, as in Wetland 1B, tPAHs should not be eliminated based on the MEC. Although the MEC takes organic carbon content into account through normalization, it has been shown that dry weight-based sediment quality guidelines such as the TEL and PEL are comparable in toxicological predictability to the organic carbon based guidelines for mixtures of contaminants, especially PAHs (Swartz 1999, MacDonald et al. 2000, Word 2004). An additional procedure that could aid in the assessment of tPAHs at Site 41 is the calculation of PEC quotients, which have been shown to be highly predictive in the case of chemical mixtures such as PAHs (MacDonald, 2003).

Response:
The Navy's approach for evaluating the sediment data were based on the professional judgment of the NAS Pensacola Partnering Team. In addition, the Team included ecological experts from the University of Florida, NOAA, and EPA Region 4 Ecological Services Division. Use of TOC-normalized data were approved by all parties in the July 29 and 30, 2003 meeting minutes provided in Attachment 3.

Comment 4:
Reference Wetland 25: Wetland 25, which is located on the north side of the base adjacent to Bayou Grande and near Redoubt Bayou, was used as a reference wetland to obtain reference values for screening inorganic constituents. Upon examination of the data in Table 6-2, Section 6 of Vol. II, it appears that iron is greatly elevated (18,500 mg/kg) in the sediment samples taken from this wetland compared to the other reference wetlands (e.g., 832 mg/kg in Wetland 32). It appears likely that iron contamination from Wetlands 18, 16, and/or 15 is reaching Wetland 25 via

Redoubt Bayou. During the site visit, it was noted that iron flocculent is very prevalent along the shore of Redoubt Bayou, reaching all the way to Wetland 16 on the eastern confluence of Redoubt Bayou and Bayou Grande. Wetland 25 is located on Bayou Grande near the western confluence of the two water bodies, and it is very possible that iron is reaching Wetland 25. Therefore, the use of Wetland 25 as a reference wetland for iron is suspect, and any concentrations of iron that were eliminated based on reference iron concentrations generated from Wetland 25 need to be re-evaluated. For example, iron was eliminated as a COPC for Wetland 10 using the reference concentration developed from Wetland 25.

Response:
Wetland 25 was used with Wetland 32 as freshwater reference wetlands. The reference wetland selection and subsequent use was approved by all members of the Pensacola Partnering Team, with consultation from NOAA, University of Florida and EPA Region 4 Ecological Services Division. Iron naturally occurs at high concentrations in the Sand and Gravel aquifer. NAS Pensacola does not obtain its potable water on the facility because of high iron concentrations. NAS Pensacola obtains its potable water from Corry Station, approximately 5 miles away. The inference of a connection between Wetlands 18, 16 and/or 15 and Wetland 25 is not clear.

Attachment 1
DDT Basewide Level Meeting Minutes

Attachment 2
USEPA Region 4 Science & Ecosystems Support Division Email
December 5, 2003

Attachment 3
July 29 and 30, 2003 Meeting Minutes

Attachment 1
DDT Basewide Level Meeting Minutes

CONFERENCE CALL MINUTES
December 21, 1998
NAS Pensacola Sites 40 & 41

Participants: Tom Dillon, David Grabka, Allison Harris, Ron Joyner, Chuck Mason

Upper Trophic Level Fish Model

Action item: Chuck will call John Connolly at Quantitative Environmental Analysis to get a reference to support the transfer factor of 3 and the apparent effects level of 50 to 60.

Action item: Tom to call chuck Mason and provide paper developed by the EPA lab in Duluth Minn. concerning No Effects Level And Lower Effects Level of DDT residues.

Decision: Model is appropriate to present to the team if the above numbers can be supported.

DDT Background

Decision: Make the DDD background 50 ppb for Sites 40 & 41 based on the results of the NOAA study and the highest detect in the "blue" wetlands.

Decision: Make the DDT background 20 ppb for Sites 40 & 41 based on the results of the NOAA study and the highest detect in the "blue" wetlands.

Decision: Make the DDE background 40 ppb for Sites 40 & 41 based on the highest detect in the "blue" wetlands.

NOTE: The above numbers are derived from the upper range of the "blue" wetlands and are not to be multiplied by a factor of 2.

Action: Chuck will research the background levels that is being proposed, search for a spiked sample study and how the background levels relate to probable effects levels.

Attachment 2
USEPA Region 4 Science & Ecosystems Support Division Email
December 5, 2003

From: <George.Linda@epamail.epa.gov>
To: <balbrecht@ensafe.com>
Date: 12/5/2003 12:37:31 PM

Barb,

The rest of the screening tables will be mailed out to you on Monday.

This excel table shows the exposure parameters that may be used for the food web models. The word file contains the citations of the parameter numbers used in the excel table. This file of references contains additional citations since I didn't go through and delete them. Just ignore the other citations. If you have any questions, please call me at (706) 355-8718.

thanks, Linda

(See attached file: 871Inputparametertable - final.xls)(See attached file: Referencesforexpparameters.doc)

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CC: <Lewis.Bobby@epamail.epa.gov>, <gbenfield@ensafe.com>

Table 1. Input parameters

Exposure Scenario	Body Weight (kg)	Dietary Composition	Area Use Factor/ Alternate AUF	PCB Concentration in Media (biotic/abiotic)	Food Ingestion Rate (kg/day dry weight)	Surface Water Ingestion Rate (L/day)	Sediment/Soil Ingestion Rate (kg/day dry weight)	TRVs NOAEL/LOAEL (mg/kg-body weight/day)
ASSESSMENT ENDPOINT 1 - Piscivorous Bird								
Representative Species - Green Heron (*Butorides virescens*)								
Maximum	0.241 [a]	100 percent fish	1/1	Max./Max.	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
RME	0.241 [a]	100 percent fish	1/1	95%UCL/95% UCL	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
Average	0.241 [a]	100 percent fish	1/1	Mean/Mean	0.0115 [b]	0.0227 [c]	0.00023 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 2 - Carnivorous Bird								
Representative Species - Eastern Screech-Owl (*Otus asio*)								
Maximum	0.15 [g]	100 percent small mammals	1/0.6	Max./Max.	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
RME	0.15 [g]	100 percent small mammals	1/0.6	95%UCL/95%UCL	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
Average	0.15 [g]	100 percent small mammals	1/0.6	Mean/Mean	0.0149 [h]	0.0170 [c]	0.0003 [d]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 3 - Insectivorous Bird								
Representative Species - American Woodcock (*Scolopax minor*)								
Maximum	0.160 [i]	100 percent worms	1/1	Max./Max.	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
RME	0.160 [i]	100 percent worms	1/1	95%UCL/95%UCL	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
Average	0.160 [i]	100 percent worms	1/1	Mean/Mean	0.0256 [j]	0.0173 [c]	0.0027 [k]	0.42[e]/0.94[f]
ASSESSMENT ENDPOINT 4 - Piscivorous Mammal								
Representative Species - Mink (*Mustela vison*)								
Maximum	0.55 [l]	100 percent fish	1/0.9	Max./Max.	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
RME	0.55 [l]	100 percent fish	1/0.9	95%UCL/95%UCL	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
Average	0.55 [l]	100 percent fish	1/0.9	Mean/Mean	0.0290 [m]	0.0578 [c]	0.003 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 5 - Carnivorous Mammal								
Representative Species - Long-tailed Weasel (*Mustela frenata*)								
Maximum	0.08 [o]	100 percent small mammals	1/0.4	Max./Max.	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
RME	0.08 [o]	100 percent small mammals	1/0.4	95%UCL/95%UCL	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
Average	0.08 [o]	100 percent small mammals	1/0.4	Mean/Mean	0.0055 [h]	0.0100 [c]	0.00015 [d]	0.15[n]/0.31[n]
ASSESSMENT ENDPOINT 6 - Insectivorous Mammal								
Representative Species - Short-tailed Shrew (*Blarina brevicauda*)								
Maximum	0.012 [p]	100 percent worms	1-Jan	Max./Max.	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
RME	0.012 [p]	100 percent worms	1/1	95%UCL/95%UCL	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]
Average	0.012 [p]	100 percent worms	1/1	Mean/Mean	0.0037 [q]	0.0027 [r]	0.00035 [d]	0.15[n]/0.31[n]

Note: The PCB concentration in water used for the maximum and RME scenarios in this assessment is 130 ug/L.
The PCB concentration in water used for the average scenario in this assessment is 24.5 ug/L.
The PCB concentration in sediment used for the Maximum scenario for this assessment is 16 mg/kg.
The PCB concentration in sediment used for the RME scenario for this assessment is 2.2 mg/kg.
The PCB concentration in sediment used for the average scenario in this assessment is 1.6 mg/kg.
The PCB concentration in soil used for the Maximum scenario for this assessment is 6400 mg/kg.
The PCB concentration in soil used for the RME scenario for this assessment is 173 mg/kg.
The PCB concentration in soil used for the average scenario in this assessment is 89.5 mg/kg.
For small mammal tissue, fish tissue and surface water concentrations, the 95%UCL values will be substituted in the RME scenario.

[a] Niethammer and Kaiser (1983).
[b] Kushlan (1978).
[c] Calder and Braun (1983).
[d] Estimated based on the results of Beyer et al. (1994).
[e] Derived from McLane and Hughes (1980).
[f] Derived from Peakall and Peakall (1973).
[g] Henny and Van Camp (1979).
[h] Nagy et al. (1999).
[i] Owen and Krohn (1973).
[j] Sheldon (1967).
[k] Beyer et al. (1994).
[l] Mitchell (1961).
[m] Bleavins and Aulerich (1981).
[n] Derived from Aulerich and Ringer (1977).
[o] Fagerstone (1987).
[p] Guilday (1957).
[q] Based on Morrison (1957)
[r] Chew (1951).

1. References

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Attachment 3
July 29 and 30, 2003 Meeting Minutes

Minutes from the Eco-sub Group Meeting to Discuss Ecological Risk Assessments at PNAS Wetlands, held 29-30 July 03.

Participants:

B. Albrecht
G. Benfield
T. Dillon
P. Hardy
A. Harris
B. Lewis
H. Ochoa

PNAS has a total of 84 wetlands, several of which can be related to an IR Site. P. Hardy presented an overview of the wetlands to the group and explained how they were originally classified and eventually grouped.

The focus of this meeting was to develop the groundwork for Wetlands 5, 6, 64, and 18. An approach including a write-up and working Excel ERA tables on these Wetlands were provided to each team member prior to the meeting for review and comment.

H. Ochoa discussed looking at adjoining wetlands as one unit, even if they had physical differences (i.e., freshwater vs estuarine, isolated vs centrally located) that may warrant differing screening/refinement values since they would likely have the same receptors. Other suggestions from the group included: grouping wetlands that are closely related (spatially) to one-another or related in proximity to a IR site; grouping wetlands according to base watersheds (which were realistically dropped when stormwater outfalls were connected to the wetlands); and ranking them based on their ERM Categories. The group decided we needed to wait until the end of COPC refinement to decide how best to address exposure from multiple wetlands. We agreed that it would largely depend on the home range for the species used for input parameters into the food web modeling. The group decided that the best approach to handle exposure from multiple wetlands would be more appropriately addressed after COPC refinement, when the assessment and measurement endpoints have been agreed upon.

B. Lewis recommended using the USEPA process as a guide and reconfiguring the developed tables to conform to EPA's 8-step approach. During this 2-day meeting, the group agreed to review the tables as currently presented, provide comments and direction on the process.

The tables will be modified to reflect only screening information during the beginning process and provide refinement of COPCs later in the process. One difference from the USEPA methodology agreed to by the group was to keep the detected and nondetected COPCs separate (currently USEPA is accustomed to seeing this information combined). G. Benfield will rework the current tables for Wetland 5 and provide a template for Group review and concurrence.

Other factors agreed to by the group include:

Global application:

- Screening process will include the max detected HQ compared to the screening values (SV), which will be the lower of the FDEP TELs or the USEPA Region 4 sediment screening values.
- Refinement process will include the average detected HQ compared to the TEL, the max detected HQ compared to the PEL and the average detectedHQ compared to the PEL.
- Nutrients will be retained in the screening process, and if detected in reasonable concentrations (when compared to the reference concentrations) will be refined out by including a footnote indicating they are essential nutrients.
- ASLs (alternate screening levels) will be renamed Refinement Values (RV).
- All abbreviations used in tables will be defined in footnotes.
- Data qualifiers will be added to the tables to identify actual detections vs nondetects.
- Surface water tables will be presented in the same format as the sediment tables.
- Reference Wetlands will include (N = XX) to inform the reviewer of the size of the data set.
- Location of maximum concentration column will be kept since it is the only reference to spatial information in the tables.

Totals:

- COPCs which have individual screening/refinement values <u>and</u> are also a part of a total value will be screened/refined using both approaches.
- Tables showing totals calculations will be placed in an appendix.
- The TEL and PEL for BEHP will be used for all phthalate esters.

VOCs:

- VOCs will be retained (especially if these COPCs are detected in the ground water and may be entering surface water) as a class of contaminants even if they are non-detects (and then discussed in the uncertainty phase of the report) unless they were also detected in field and/or laboratory blanks.
- Field/equipment blank data will be reviewed for VOC or lab contaminants.

PAHs:

- The EnSafe team will evaluate the current PAH detections in all samples collected at NAS Pensacola to determine if PAH background can be developed for NAS Pensacola.
- PAHs will all be corrected to organic carbon (OC normalized)

Pesticides:

- Pesticide COPCs will be ranked to see if there is an obvious break in concentrations similar to the DDT basewide levels that would indicate normal applications.

- Total DDTs will be added to the constituent totals.

Site Specific Tools:

- ERMs will be kept as an additional tool (data tables will be moved to the appendix, graphs will be kept in the body of the report).

- ERMs will be most useful after COPC refinement during the problem formulation phase to help evaluate the current site specific toxicity data as well as focus any area where additional site specific toxicity work may be necessary.

The Group discussed the application of marine ERMs to freshwater sediments and agreed that Long & MacDonald address the difference between freshwater and saltwater application for the ERL and ERM COPCs and found minimal differences, so the approach is applicable. The Group agreed to this approach.

- Correlation of toxicity data with ERM quotients will verify that toxicity testing does answer questions of what's been done, and that toxicity data indicates what we expect. Group Category 2, 3, and 4, with toxicty outcomes for vertebrate and invertebrate species.

- Interpretive tool for metals will be used as an additional tool in this process (estuarine wetlands will be graphed by hand, freshwater wetlands will be plotted by Excel)

- Benthic information will be moved to the appendix section of the report.

G. Benfield stressed to the group that he is concerned that we are re-inventing the wheel since many sediment samples, toxicity tests, and models have been developed, applied, and published in a previous RI. His concerns are related to the client's perspective and does not want the client to feel that we are back-tracking. The Group acknowledged his concerns and indicated that as long as enough data is available to make informed decisions, and everyone keeps the endpoint (receptor) in mind, the best outcome can be achieved.

The Group discussed whether a stand alone model for each wetland (developed by max number models or average number models, or driven by COPCs remaining after the refinement) or if adjoining wetlands (Wetlands 5, 6, and 64) could be combined as a whole for a single unit? This approach enhanced the need to identify the assessment endpoints andidentify what type of data has already been collected (and that it is representative of the area). B. Albrecht will develop a matrix identifying what has/has not been collected for each wetland of concern.

The Group agreed that toxicity data will serve as the primary measurement endpoint for the assessment endpoint for benthos, and food web models utilizing fish tissue concentrations and BSAFs will serve as the measurement endpoint for the piscivorus birds assessment endpoint for. This information coupled with sediment, nearby soil & groundwater, and surface water can be applied to models identifying the home range and foraging areas for conservative species selected based on protective standards for the areas in question. The Group agreed it will be better to stay with smaller species (green heron vs the blue heron) because this approach is moreprotective of the area and includes smaller (more focused) ranges.

H. Ochoa is currently working on a new document for FDEP in which new sediment and soil screening values will be presented for secondary poisoning. He anticipates presenting the report to FDEP by Aug 2003.

The Group discussed some surface water values which were collected during periods of low average rainfall, and had high levels of turbidity (causing artifacts for inorganics). Phase II data was collected January 1996 and Phase III was collected roughly 20 months later during August 1997. HQs were an order of magnitude lower during Phase III than Phase II. The Group agreed if the only item between moving a wetland to NFA was high turbidity, then we should consider re-sampling. If re-sampling does occur, two samples will be analyzed (filtered and non-filtered) to alleviate this discrepancy. (The Ambient Water Quality Criteria were based on filtered data.)

The Group discussed basing risk decisions on toxicity tests, and asked if this was realistic and also a conservative approach? The Group decided to review this information by comparing the ERM quotients to toxicity data and seeing if this approach would direct the team to resample. Sediment quality triad analyses used in previous ERAs will be dropped from the current assessment, but the data used to generate the triad information will be added to an appendix in the document.

The following tasks were agreed to by the Group before the meeting ended:

- Minutes of the Eco-sub Group Meeting and revised tables will be circulated to the Group by 6 Aug 03

- Comments are due 13 Aug 03
- Every wetland (sediments only) through refinement will be due 30 Sept 03